ANALYZING FORCE, DELAMINATION, ROUGHNESS, AND CHIPS OF DRILLED CARBON FIBRE REINFORCED POLYMER (CFRP) COMPOSITE PLATE EXPERIMENT

This graduation project report submitted by:

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MECHANICAL ENGINEERING DEPARTMENT

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VALIDATION SHEET

This Final Project Report has been checked, accepted and legalized by supervisor, knowing by Head of Mechanical Engineering Department Wuxi Institute of Technology and Head of Mechanical Engineering Department of Muhammadiyah Surakarta University.

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FOREWORD

My thanks to Allah SWT by His-grace and mercy, so I can accomplish this Graduation Project Report as the time scheduled. This writing was done to complete the undergraduate study in Mechanical Engineering Department of Muhammadiyah Surakarta University. The writer will not be able to finish this paper without support and guidance of some great people. Therefore, in this opportunity I would like to grateful for;

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The writer realizes that this writing may not be perfect, because of my lack of knowledge and ability. Therefore, I would like to get some advice to improve this writing. Finally, I hope this writing will be useful for everyone read it.

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ABSTRACT

Abstract: The attributes of carbon fiber reinforced polymer composite have expanded their utility from aerospace to domestic appliances and new possibilities for their usage emerge almost from time to time. So that it can be used in many possible applications, the laminate needs to be drilled for assembly purposes. Considering their compliance to high temperature process from drilling, various phenomena may occur during this process, e.g. delamination, which affect in both mechanical properties as well as occurrence of manufacturing damage of a treated material. The results compare drilling process in various machining parameters along with the analysis of force, delamination, roughness, and chip produced with expectations to extend the life cycle of these laminates as a consequence of enhanced reliability.

Keywords: carbon fibers reinforced; chips produced by drilling; composite material; delamination; drilling composite structures; drilling force; drilling parameters; drilling temperature; surface roughness